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WATER REUSE AND ENVIRONMENTAL CONSERVATION PROJECT

CONTRACT NO. EDH–I–00–08–00024–00 ORDER NO. 04

REUSE KNOWLEDGE CENTER; CONCEPT PAPER

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Submitted to:

USAID Jordan

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AECOM

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LIST OF ACRONYMS

GoJ	Government of Jordan
HFDB	Hashemite Fund for the Development of Jordan Badia
MoA	Ministry of Agriculture
MoEnv	Ministry of Environment
MOH	Ministry of Health
MWI	Ministry of Water and Irrigation
NCARE	National Center for Agricultural Research and Extension
NGO	Non-Governmental Organization
RKC	Reuse Knowledge Center
USAID	US Agency for International Development
WAJ	Water Authority of Jordan
WEEC	Water, Environment, Energy Center
WRECP	Water Reuse and Environmental Conservation Project
WUA	Water Users Association

1 Introduction

The USAID Water Reuse and Environmental Conservation Project (the project, or WRECP) works throughout Jordan in institutional capacity building, pollution prevention for industries, solid waste and wastewater management, and water reuse. The project goal is to protect and conserve scarce resources through regulation, education, and coordination with industry, local communities and the private sector. The project is implemented by AECOM and a team of international and Jordanian partner firms. This five-year project has four primary tasks:

- Task 1 – Institutional and Regulatory Strengthening
- Task 2 – Pollution Prevention and Industrial Water Management
- Task 3 – Disposal Sites Rehabilitation and Feasibility Studies
- Task 4 – Water Reuse for Community Livelihood Enhancement, including biosolids

Task4, "Water Reuse for Community Livelihood Enhancement," focuses on promoting the beneficial and safe reuse of treated wastewater in Jordan. The project is currently working in Wadi Mousa and Al-Lajjoun, and is developing water reuse plans for Al-Za'atari and Azraq refugee camps.

As part of Task 4, the project is providing support to establish a Reuse Knowledge Center (RKC), to collect and disseminate knowledge to further promote awareness and best practices in water reuse across the Kingdom.

This paper explains a sequence of planned actions to support the establishment of the RKC. The goal of this paper is to demonstrate that the approach developed by the project for the RKC concept, activities, and structure will result in establishing an effective, representative, sustainable, and linkable RKC to promote water reuse in Jordan.

1.1 Background

Water scarcity is one of the most important natural resource constraints on Jordan's economic growth. High population growth, coupled with increasing urban and industrial demands for water, has placed unprecedented demands on the fresh water resources. This situation has been worsened by the continuous depletion of Jordan's fresh water supply at an alarming rate.

Available water supply is less than demand. According to Jordan's Water Strategy (2009), the country's annual per capita water availability is less than 150 m^3 per year. By 2025, the available per capita per year is projected to decline to 90 m^3 per capita per year, putting Jordan in the category of an absolute water shortage (El-Nasser, 2009).

Approximately 70% of freshwater is used in non-potable applications; the major consumer of freshwater is the agricultural sector, using about 64%, and the shares consumed by tourism and industries are 4% and 2%, respectively, while the municipal share is 30% (WAJ, 2009). Since the main priority in Jordan is domestic water use, the freshwater share used for non-potable purposes is expected to decrease in the future.

Jordan's Water Strategy issued in 2009 stated that "Wastewater shall not be disposed of; instead, it shall be a part of the water budget." Accordingly, beneficial use of reclaimed water has been recognized as a crucial component of Jordan's integrated water resources management and an important tool for effective freshwater conservation.

However, treated wastewater as a resource has not been completely deployed yet and can be further promoted and developed. This use would ease the stress on existing freshwater resources and improve the livelihoods of many communities across the Kingdom.

USAID has been supporting the Government of Jordan (GoJ) efforts to promote water reuse through a range of actions. Progress has been made on all fronts, but more work is still needed to manage water reuse in an economically feasible, technically applicable, socially acceptable, and safe manner.

To enable Jordan to manage wastewater use better and, and to sustain USAID's continuous technical assistance provided to the GoJ in improving the country's water sector, the project is to develop and establish a Reuse Knowledge Center (RKC); the center is to promote the safe, efficient, and beneficial reuse of treated wastewater, with the ultimate goal of protecting the environment, conserving fresh water sources, and promoting economic growth.

The center will bring under one roof the technical, academic and analytical skills and expertise required for continuous support to the GoJ, local communities, private entities, academic and research centers, and other stakeholders in the development and implementation of water reuse engineering and management.

Please note that the project has identified the Water, Environment and Energy Center (WEEC) at the Jordan University as a potential partner to host the RKC. Several meetings took place between the project and WEEC management, resulting in the road map for developing this concept paper.

2 Reuse Knowledge Center (RKC)

The project will provide support to establish a RKC, to support Jordan's broad Kingdom-wide strategy to promote and advance the beneficial reuse of wastewater, in ways that meet government requirements, comply with applicable laws in Jordan, and conform to international best practices.

2.1 RKC Concept

The project approach in developing the concept of the RKC is to build an effective, representative, sustainable, and linkable network of institutions from public, private, and academic, as well as individuals, including decision makers, independent experts, young professionals, students, and end users. This network will work together within a structured charter and planned activities. This approach will lead to robust science and technology, research, management, and policy advances much more quickly than would reliance on one lead institution; it will also result in more rapid implementation of practical solutions to the pressing problems of the water and environment sectors in Jordan and the region.

Based on the above, the Reuse Knowledge Center (RKC) will act as a body (Hub) of knowledge sharing, information development, and experience exchange. Moreover, the RKC will form a pool rich of experts and professional organizations specialized in integrated water reuse engineering and management. This body will be used to benefit existing water reuse activities and enhance planning for future projects.

2.2 Proposed Activities

The activities of the RKC are designed to achieve the RKC objective in promoting the safe and efficient use of treated wastewater in Jordan. However, the proposed activities will also help to strengthen the RKC charter, advance its knowledge, and support its sustainability.

The RKC activities will focus on 4 main elements: capacity building and training; fostering cross cutting research; consultancy services; and generation of a water reuse tool box as described below and as shown in Figure 2-1.

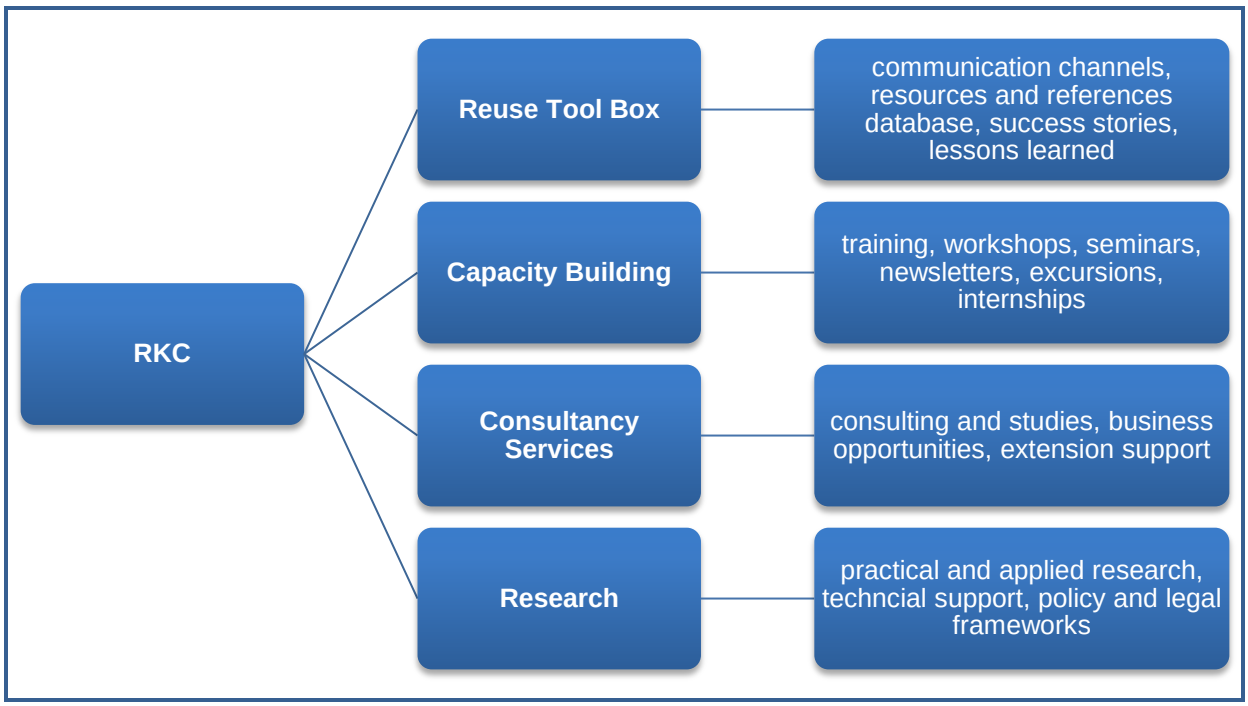

Figure 2-1: RKC main activities

Training and Capacity Building

The RKC will assist in educating and improving the abilities of the water reuse stakeholders to perform their core roles and responsibilities. The stakeholders will primarily be those from water and sanitation, agriculture, environment, reuse communities (farmers and Water Users' Associations (WUAs)), students and researchers, and the private sector.

Capacity building activities will focus on helping stakeholders to understand and address the water sector needs, define and achieve their objectives, and define and overcome challenges that are facing the sectors. The RKC will work as a platform that allows the different stakeholders to work together effectively and to support each other through the transfer of ideas, experiences, and expertise in order to support the safe and productive use of treated wastewater.

The RKC's will also conduct systematic training courses, conferences, seminars and workshops that cover a wide variety of topics related to water reuse that are of interest to the RKC stakeholders and members. These events and training courses will also help in networking and building trust among the RKC members and stakeholders, and thus promote its sustainability and continuous development in the long-term.

Moreover, the RKC will provide opportunities for students to be involved in field research activities through internship programs that will fully or partially cover the students' educational fees, while at the same time providing the students with on-the-ground professional experience in water reuse.

Applied Research

The RKC will create an enabling environment for its members to conduct scientific and applied research by connecting governmental entities, research centers, universities and the private sector and by strengthening the relationships among them. In particular, the

connection between science/practice/policy, the linking with real case studies, and the connection to postgraduate education and capacity development can be documented as best practice examples.

Water, wastewater and reuse experts from the various Jordanian universities and research centers will have opportunities to apply their research in cooperation with the governmental and international funding entities and the end users.

Governmental entities and end users face immediate issues and severe budget constraints that prevent them from conducting innovative research and implementing it. Therefore, the RKC will create links between governmental entities, international funding agencies and water reuse experts from the academia and research institutes in order to investigate and develop science, technology, and policies that are unique to Jordan‘s particular situation.

The RKC will help in prioritizing research in accordance with the need for practical solutions and in balancing them against financial constraints. In addition, strengthening the relationships between the different stakeholders will lead to new discoveries and more rapid implementation of solutions to pressing problems.

Research and academic institutions will be able to access the latest research, projects and progress reports in the water reuse field through the RKC. Building on the hosting body connections and established platform, the RKC will attract leading national and international researchers to work within the center, and develop strong local, national, and international collaborative links.

Consultancy Services

The RKC activities should always drive towards long term sustainability and development. Therefore, the RKC will work as an expertise hub where consultancy services in water, wastewater and reuse topics will be provided by the RKC members. The RKC members will profit from the consultancy activities, as will the RKC, to support its financial sustainability. Also, the RKC will offer pro-bono services to those who are unable to afford them, such as local communities, small farmers, small and medium industries, and local NGO’s. All of the above will lead to promoting economic growth by providing new jobs and by identifying and using new sources of funding.

The RKC will also network with international partner institutions, such as leading universities, public and private institutions, and similar centers. This kind of partnership will add value to services to be provided by the center, through building capacities of experts of the center and through establishing scientific, expert and innovation platforms for ongoing activities of the center, based on the best available expertise, international practice and on the application of sound methodology and advanced technical and analytical tools.

Reuse Tool Box

The RKC will develop a tool box that consists of an organized collection of case studies, reference documents, reader lists, external web sites and other supporting materials in water reuse. The RKC will also facilitate communication and cooperation among stakeholders and scientific groups through various forums and workshops, and serve as a source of data with a well-defined system for data flow, storage and regular updating.

It is envisioned that the tool box will be in the form of an electronic platform. This will facilitate the access to the center‘s resources, and will help to spread the knowledge and tools that have evolved from the center‘s research activities. It will also help in enhancing knowledge management and collaboration between RKC members and stakeholders.

2.3 Structure and Charter

The RKC will be embedded within a well established institution. The strengths of this approach are the credibility of the host organization; the high sense of ownership created as a result of partnership with that institution; the ability to capitalize on networks built by the host institution and build new synergies; and the ability to avoid capital costs for establishing a new RKC. Furthermore, the embedded model allows for strengthening of capacities of the existing institution, as well as key partners, by the RKC.

The RKC structure will reflect the RKC's objectives as well as the RKC stakeholders' needs. The structure will foster flexibility to embrace changes and transparency, adequacy, and efficiency in decision making. Moreover, it should also support the financial sustainability and future development of the center.

To be successful in achieving the above, the project believes that the RKC must be designed and established in a participatory way, with involvement and input of key stakeholders from the early stages of design of the center and throughout its further establishment. Therefore, the final structure of the RKC will be defined in later stages, after defining and agreeing with the main stakeholders on the most suitable structure that should be adopted.

2.4 Action Plan

During Task 4 workgroup meetings, the project discussed with selected stakeholders, such as MWI, MoEnv, WAJ, NCARE, HFDB, and MoA, the USAID's intention to establish the RKC in Jordan. Based on these general discussions, and with USAID concurrence, the project plans to take the following steps for establishing the RKC:

1. This first step has already been accomplished. The project Identified and evaluated the potential hosting organization (Water, Energy, and Environment Center at JU) for the RKC. The hosting organization was primarily assessed for the technical skills and capacities of the institution's staff in the area of water reuse; potential for further capacity building; level of technical/technological capabilities and potential for extension; and financial state of the institution, with sources of funding and potential for further financial sustainability.
2. Develop the RKC concept, scope of activities, and action plan in coordination with the host organization. The project intends to use this concept paper to initiate formal and informal discussion with the key stakeholder institutions to clearly define the need for the RKC and to determine the purpose and scope of the RKC as the first step. This would be followed by definition of the mission statement, goals and objectives, as well as charter of the RKC.
3. Develop and sign partnership with the hosting organization. This event will take place during a participatory workshop with the main stakeholders. The purpose of the workshop is to clearly define the roles and responsibilities of the stakeholders in managing the RKC.
4. As a final step, the project will work with the hosting organization in developing the overall long-term business development and management plan for the RKC, and preparing annual work plan and budget for the first year of center's operation.

3 References

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